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Practitioner's Docket No. 2550/189

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Number: 7089792

Issued: 08/15/2006

Name of Patentee: Analog Devices, Inc.

Title of Invention: Micromachined Apparatus Utilizing Box Suspensions

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

**REQUEST FOR CERTIFICATE OF CORRECTION  
OF ASSIGNEE'S NAME ON PATENT AND TEXT OF PATENT -- PTO MISTAKE  
(37 C.F.R. § 1.322(a))**

1. Attached in duplicate is Form PTO-SB44, with at least one copy being suitable for printing. Amendment filed on August 25, 2005
2. The purpose of this correction is to correctly identify the name of the assignee. The correct identification of the assignee was made in item 3 of the Issue Fee Transmittal form (PTOL-85b). A copy of the form is attached.
3. The purpose of this correction is to also correct the text of the patent. The exact page and line number where the error is shown correctly in the application file is:

Page 4, line 8 of claim 11, of Amendment filed on August 25, 2005.

A copy of the Amendment is attached.

4. Please send the Certificate to:

Name: Jeffrey T. Klayman

Address: BROMBERG & SUNSTEIN LLP  
125 Summer Street  
Boston, MA 02110-1618

Date: September 7, 2006

  
\_\_\_\_\_  
Jeffrey T. Klayman  
Registration No. 39,250  
BROMBERG & SUNSTEIN LLP  
125 Summer Street  
Boston, MA 02110-1618  
617-443-9292  
Customer No. 02101

02550/00189 542976.1

UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTIONPage 1 of 1

PATENT NO. : 7089792

APPLICATION NO.: 10/646,332

ISSUE DATE : August 15, 2006

INVENTOR(S) : John A. Geen

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On title page, item 73 Assignee  
replace "Analod"  
with --Analog--.

Col. 18, line 23  
replace "fingers"  
with --finger--.

MAILING ADDRESS OF SENDER (Please do not use customer number below): 7089792

Jeffrey T. Klayman  
Bromberg and Sunstein LLP  
125 Summer Street  
Boston, MA 02110-1618

1

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

SEP 13 2006

UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTIONPage 1 of 1

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ISSUE DATE : August 15, 2006

INVENTOR(S) : John A. Geen

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*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

SEP 13 2006

## PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
**or Fax** (571)-273-2885

**INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

2101 7590 03/23/2006

**BROMBERG & SUNSTEIN LLP**  
**125 SUMMER STREET**  
**BOSTON, MA 02110-1618**

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

### Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

Jeffrey T. Klayman	(Depositor's name)
	
(Signature)	
June 21, 2006	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,332	08/22/2003	John A. Geen	2550/189	8282

TITLE OF INVENTION: MICROMACHINED APPARATUS UTILIZING BOX SUSPENSIONS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1400	\$300	\$1700	06/23/2006

EXAMINER	ART UNIT	CLASS-SUBCLASS
KWOK, HELEN C	2856	073-504020

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). <input type="checkbox"/> Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached. <input type="checkbox"/> "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev.03-02 or more recent) attached. Use of a Customer Number is required.	2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
<b>Bromberg &amp; Sunstein LLP</b>	
2 _____	
3 _____	

**3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)**

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Analog Devices, Inc.

Norwood, Massachusetts

Please check the appropriate assignee category or categories (will not be printed on the patent):  Individual  Corporation or other private group entity  Government

**4a. The following fee(s) are enclosed:**

Issue Fee  
 Publication Fee (No small entity discount permitted)  
 Advance Order - # of Copies 1

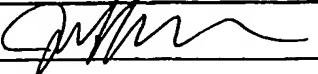
**4b. Payment of Fee(s):**

A check in the amount of the fee(s) is enclosed.  
 Payment by credit card. Form PTO-2038 is attached.  
 The Director is hereby authorized to charge the required fee(s), or credit any overpayment, to Deposit Account Number 10-4972 (enclose an extra copy of this form).

**5. Change in Entity Status (from status indicated above)**

a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.  b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above. NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature 

Date June 21, 2006

Typed or printed name Jeffrey T. Klayman

Registration No. 39,250

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: John A. Geen

Application No.: 10/646,332

Date Filed: 08/22/2003

For: Micromachined Apparatus Utilizing Box Suspensions

Group No.: 2856

Examiner: Kwok, Helen C.



Mail Stop Amendment  
 Commissioner for Patents  
 P.O. Box 1450  
 Alexandria, VA 22313-1450

## AMENDMENT TRANSMITTAL

1. Transmitted herewith is an amendment for this application.

## STATUS

2. Applicant is other than a small entity.

## EXTENSION OF TERM

3. The proceedings herein are for a patent application and the provisions of 37 C.F.R. 1.136 apply. Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition for extension of time.

## CERTIFICATION UNDER 37 C.F.R. §§ 1.8(a) and 1.10\*

(When using Express Mail, the Express Mail label number is mandatory;  
 Express Mail certification is optional.)

I hereby certify that, on the date shown below, this correspondence is being:

## MAILING

deposited with the United States Postal Service in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

37 C.F.R. § 1.8(a)  
 with sufficient postage as first class mail.

37 C.F.R. § 1.10\*  
 as "Express Mail Post Office to Addressee"  
 Mailing Label No. \_\_\_\_\_ (mandatory)

## TRANSMISSION

facsimile transmitted to the Patent and Trademark Office, (703) \_\_\_\_\_

  
 Signature \_\_\_\_\_

Date: August 25, 2005

Jeffrey T. Klayman

(type or print name of person certifying)

\* Only the date of filing (§ 1.6) will be the date used in a patent term adjustment calculation, although the date on any certificate of mailing or transmission under § 1.8 continues to be taken into account in determining timeliness. See § 1.703(j). Consider "Express Mail Post Office to Addressee" (§ 1.10) or facsimile transmission (§ 1.6(d)) for the reply to be accorded the earliest possible filing date for patent term adjustment calculations.

## FEE FOR CLAIMS

4. The fee for claims (37 C.F.R. 1.16(b)-(d)) has been calculated as shown below:

(Col. 1) CLAIMS REMAINING AFTER AMENDMENT	(Col. 2) HIGHEST NO. PREVIOUSLY PAID FOR	(Col. 3) PRESENT EXTRA	OTHER THAN A SMALL ENTITY		
<b>TOTAL</b>	26	—	26	=	0 x \$ 50.00 = \$ 0.00
INDEP.	4	—	4	=	0 x \$ 200.00 = \$ 0.00
<b>FIRST PRESENTATION OF MULTIPLE DEP. CLAIM</b>				<b>+</b> \$ 0.00 = \$ 0.00	
				<b>TOTAL ADDIT. FEE</b>	\$ 0.00

No additional fee for claims is required.

## FEE DEFICIENCY

5. If an additional extension and/or fee is required, charge Account No. 19-4972.

If an additional fee for claims is required, charge Account No. 19-4972.

Date: August 25, 2005

  
\_\_\_\_\_  
Jeffrey T. Klayman  
Registration No. 39,250  
BROMBERG & SUNSTEIN LLP  
125 Summer Street  
Boston, MA 02110-1618  
US  
617-443-9292  
Customer No. 002101

02550/00189 427075.1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Geen, John A.  
Appl. No: 10/646,332  
File Date: August 22, 2003

Art Unit: 2856  
Examiner: Kwok, Helen C  
Docket No.: 2550/189

Invention: MICROMACHINED APPARATUS UTILIZING BOX SUSPENSIONS

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CERTIFICATE OF MAILING

I hereby certify that this document, along with any other papers referred to as being attached or enclosed, is being deposited with the United States Postal Service as first class mail with sufficient postage in an envelope addressed to: Commissioner for Mail Stop Amendment, Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on August 25, 2005

Jeffrey T. Klayman



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Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

AMENDMENT

Dear Sir:

In response to the Office action of May 25, 2005, please amend the above-identified application as follows:

**Amendments to the Claims** are reflected in the listing of claims which begins on page 2 of this paper.

**Remarks/Arguments** begin on page 8 of this paper.

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1. (Currently Amended): A micromachined apparatus comprising:  
a frame having a substantially rectangular perimeter;  
a plurality of elongated stress relief members arranged substantially in a rectangular pattern outside of the frame perimeter, each stress relief member having at least one substrate anchor substantially at its an intersection of said stress relief member with a line through the midpoints of a pair of opposite frame sides; and  
a plurality of box suspensions coupling the corners of the frame to the plurality of stress relief members, each box suspension including a substantially rectangular array of box flexures, the box flexures at a first corner of the array coupled to the frame, the box flexures at a second corner opposite the first corner coupled respectively to the ends of a pair of stress relief members but not to one another, the box suspension further including a diagonal brace coupled between third and fourth corners of the array, the box flexures at the second corner further coupled respectively about a pivot point to a plurality of support flexures, the plurality of support flexures having a substrate anchor substantially at an intersection with a line through the first and second corners.

Claim 2 (Original): The apparatus of claim 1, wherein the frame has a substantially square perimeter and the plurality of elongated stress relief members are arranged substantially in a square pattern outside of the frame perimeter.

Claim 3 (Original): The apparatus of claim 1, wherein the rectangular array is substantially square.

Claim 4 (Currently Amended): The apparatus of claim 1, wherein the ~~ratios of the sides of the rectangular array are substantially the same as those of the rectangular perimeter and rectangular pattern the frame, the elongated stress relief members, and the box flexures are arranged~~ such that a straight line from ~~the an~~ intersection point of the lines through the midpoints of each pair of opposite frame sides through ~~its a corner of the rectangular perimeter~~ also passes through diagonally opposite corners of the rectangular array.

Claim 5 (Original): The apparatus of claim 1, wherein the plurality of stress relief members consists of four stress relief members, each extending substantially between two pivot points.

Claim 6 (Original): The apparatus of claim 1, wherein the box flexures are designed to align substantially with a rectilinear grid for defining the apparatus.

Claim 7 (Original): The apparatus of claim 1, wherein each stress relief member includes a plurality of substrate anchors.

Claim 8 (Original): The apparatus of claim 1, wherein each stress relief member includes a single elongated substrate anchor.

Claim 9 (Currently Amended): The apparatus of claim 1, wherein the diagonal brace substantially restricts motion of the frame other than rotation of the frame

about ~~the~~ an intersection point of the lines through the midpoints of each pair of opposite frame sides.

Claim 10 (Original): The apparatus of claim 1, wherein the frame includes finger structures that extend outward toward the stress relief members.

Claim 11 (Currently Amended): The apparatus of claim 10, further comprising: a plurality of sensing fingers positioned between the frame fingers structures within the space between the frame and the stress relief members.

Claim 12 (Currently Amended): The apparatus of claim 1, wherein the frame, the stress relief members, and the box suspensions are micromachined from a common piece of material.

Claim 13 (Original): The apparatus of claim 1, wherein the apparatus is a micromachined gyroscope.

Claim 14 (Currently Amended): A micromachined apparatus comprising a substantially rectangular array of box flexures, the box flexures at a first corner of the array coupled to a frame, the box flexures at a second corner opposite the first corner coupled respectively to ~~the~~ ends of a pair of stress relief members but not to one another, the ~~box~~ suspension apparatus further including a diagonal brace coupled between third and fourth corners of the array, the box flexures at the second corner further coupled respectively at a pivot point to a plurality of support flexures, the plurality of support flexures having a substrate anchor substantially at an intersection with a line through the first and second corners.

Claim 15 (Original): The apparatus of claim 14, wherein the rectangular array is substantially square.

Claim 16 (Cancelled)

Claim 17 (Original): The apparatus of claim 14, wherein the box flexures are designed to align substantially with a rectilinear grid for etching the box flexures.

Claim 18 (Currently Amended): The apparatus of claim 14, wherein the diagonal brace substantially restricts motion of the frame other than rotation of the frame about an intersection point of lines through the midpoints of each of a pair of opposite frame sides.

Claim 19 (Currently Amended): A method for reducing stresses in a micromachined apparatus, the method comprising:

forming a plurality of micromachined structures from a common material, the micromachined structures including a frame suspended from a plurality of stress relief members by a plurality of box suspensions, each box suspension including a substantially rectangular array of box flexures, the box flexures at a first corner of the array coupled to the frame, the box flexures at a second corner opposite the first corner coupled respectively to the ends of a pair of stress relief members but not to one another, the box suspension further including a diagonal brace coupled between third and fourth corners of the array, the box flexures at the second corner further coupled respectively about a pivot point to a plurality of support flexures;

anchoring each of the plurality of stress relief members to a substrate substantially at an intersection of the stress relief member with a line through the centers of opposite sides of the frame; and

anchoring the support flexures of each of the plurality of box suspensions to the substrate using a single anchor substantially at an intersection with a line through opposite corners of the frame.

Claim 20 (Original): The method of claim 19, wherein the rectangular array is substantially square.

Claim 21 (Original): The method of claim 19, wherein the plurality of stress relief members consists of four stress relief members, each extending substantially between two pivot points.

Claim 22 (Original): The method of claim 19, wherein the box flexures are designed to align substantially with a rectilinear grid for etching the box flexures.

Claim 23 (Currently Amended): The method of claim 19, wherein the diagonal brace substantially restricts motion of the frame other than rotation of the frame about an intersection point of lines through the midpoints of each of a pair of opposite frame sides.

Claim 24 (Currently Amended): A micromachined apparatus comprising:  
a substrate;  
a frame supporting a number of resonating structures;  
suspension means for suspending the frame over and parallel to the substrate, the suspension means substantially restricting movement of the frame

relative to the substrate to only rotational movement about an axis normal to the substrate; and

stress reducing means for reducing stresses in the suspension means,  
wherein the suspension means comprises a plurality of box suspensions, each  
box suspension coupled at a corner of the frame.

Claim 25 (Cancelled)

Claim 26 (Original) The apparatus of claim 24, wherein the stress reducing means comprises:

a plurality of stress reducing members, each stress reducing member anchored to the substrate substantially at an intersection point with a line through the center of opposite frame sides.

## REMARKS/ARGUMENTS

Claims 1-26 are currently pending in the application. Claims 1-23 stand objected to for various informalities. Claims 14-18 stand rejected as being indefinite. Claims 24 and 26 stand rejected as being anticipated by U.S. Patent 5,392,650 (O'Brien).

The Applicant thanks the Examiner for her consideration of the application. The applicant requests reconsideration of the amended claims in view of the following remarks.

### Paragraphs 1-3 of the Office Action

The Examiner objected to claims 1-23 because of various claim informalities. The Examiner also rejected claims 14-18 under 35 U.S.C. section 112 as being indefinite due to lack of antecedent basis for the phrase "the box suspension" in claim 14 and for the phrase "the plurality of stress relief members" in claim 16.

The Applicant has amended the claims 1, 4, 9, 11, 12, 14, 18, 19, and 23 to overcome the Examiner's objections to claims 1-23. The Applicant has also amended claim 14 to remove the phrase "the box suspension" and has cancelled claim 16 without prejudice. As a result of these amendments, claims 1-15 and 17-23 are now believed to be in allowable form.

### Paragraphs 4 and 5 of the Office Action

The Examiner rejected claims 24 and 26 as being anticipated by U.S. Patent 5,392,650 but indicated that claim 25 includes allowable subject matter. Applicant has chosen to accept the subject matter deemed allowable by the Examiner. Therefore, Applicant has amended claim 24 to include the limitations from dependent claim 25 and has cancelled claim 25. Claim 24 is now believed to be in allowable form. Because a dependent claim is deemed to include all limitations of its base claim and any intervening claims, claim 26 is also believed to be in allowable form.

All pending claims, as amended, are believed to be in a form suitable for allowance. Therefore, the application is believed to be in a condition for allowance. The Applicant respectfully requests early allowance of the application. The Applicant requests that the Examiner contact the undersigned, Jeffrey T. Klayman, if it will assist further examination of this application.

The applicants do not believe any extension of time is required for timely consideration of this response. In the event that an extension has been overlooked, this conditional petition of extension is hereby submitted, and Applicants request that deposit account number 19-4972 be charged for any fees that may be required for the timely consideration of this application.

Date: August 25, 2005

Respectfully submitted,



Jeffrey T. Klayman  
Registration No. 39,250  
Attorney for Applicants

Bromberg & Sunstein LLP  
125 Summer Street  
Boston, Massachusetts 02110-1618  
Tel: (617) 443-9292  
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02550/00189 426676.1